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COMPREHENSIVE PROPERTY RIGHTS: FISHERY TRUSTS

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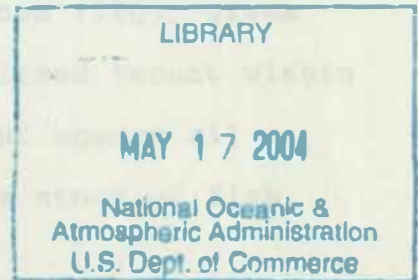
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ABSTRACT

While the concept of fishery management based upon property rights is widely suggested, most management proposals create only the limited usufruct rights accorded a lessee, rather than the comprehensive rights accorded a true property owner. The most common proposal, an individual transferable quota (ITQ), gives the rights holder only the right to harvest a fixed amount within a specific year, while leaving to the management agency all authority over the status of the key asset, the stock of fish.

A true property rights scheme, a fishery trust, is proposed. A fishery trust is a corporation that has comprehensive management authority. The fishery trust is owned through a corporate ownership rules (e.g., one-share, one-vote). Owner shares in the trust are distributed initially to some group (probably existing fishers), who then vote those shares to determine the fishery governance structure. Shares are freely transferable. The responsibility of the trust would be comprehensive, including responsibility for the cost of administration and enforcement as well as management decisions. Because the ownership rights in the trust are permanent and transferable, owners have every incentive to husband the resource. Although co-management has been suggested as a vehicle for greater fisher involvement in management, a corporate ownership structure has long term

incentives that are clearly superior to those under collective or cooperative management rules (e.g., one-person, one-vote).

COOPERATIVE PROPERTY RIGHTS: FISHERY TRUSTS

It is generally agreed that open access to fisheries resources creates a tragedy of the commons that results in excessive harvesting and depletion of the resource. But this agreement on the fact of the tragedy has yet to produce a clear consensus on the best approach to fisheries management.

Initially, fisheries economists proposed restricting the number of fishing vessels licensed to fish (limited entry) as a management approach. But limited entry created its own difficulties due to the use of any unregulated technology and increased effort. Economists have more recently advocated individual transferable quotas (ITQs) as the most appropriate management approach. However, the ITQ approach really amounts to simply giving the government the right to sell the optimal level of harvest and effort, and to let the market price of rights do the rest. The government can bring harvesters more directly into the management process and avoid the problems of individual transferable quotas. However, the ITQ approach is still a market-based approach to fisheries management.

COMPREHENSIVE PROPERTY RIGHTS: FISHERY TRUSTS

It is generally agreed that open access to fisheries resources creates a "tragedy of the commons" that results in excessive harvesting inputs and overuse of the resource. But this agreement on the roots of the fishery problem has yet to produce a clear consensus on the best approach to fisheries management.

Initially, fisheries economists proposed restricting the number of fishing vessels licensed to fish (limited entry) as a management approach. But limited entry often created its own inefficient incentives to increase the use of any unrestricted inputs by each license holder. Economists have more recently advocated individual transferable quotas (ITQs) as the most appropriate management approach. However, the ITQ approach really assumes that many key elements of fisheries governance, including the optimal level of harvests and enforcement, must be left to the government. In an effort to bring harvesters more actively into the management process, some social scientists have advocated democratic co-management governance structures for fisheries.

The present analysis suggests fisheries governance based upon the principles of corporate organization as an alternative. A corporate governance structure provides a vehicle for effective joint decision-making by producers, but avoids the inefficient economic incentives created by the governance structures of cooperative decision-making.

ECONOMIC THEORY OF FISHERIES MANAGEMENT

The economic diagnosis of the destructive incentives under open access fishing was originally made by Gordon [7] and Schaefer [16]. Gordon argued that harvesters ignore the negative impact of their decisions upon the stock of fish and the indirect negative consequences for other harvesters. Therefore, excess fishing effort is attracted to the industry and the fishery resources will be over-exploited.

Scott [17] proposed that the standard of the "sole owner" be used to judge the effectiveness of fisheries management. But a literal sole owner of a fishery would usually have to own rights to a very large set of resources over a wide geographic area. While giving the entire North Atlantic groundfish resource to one person may not pose any problem for the economic theorist, such a recommendation faces insurmountable political problems. In recognition of the impossibility of a literal sole owner, that concept has evolved into the following economic question: How

Can rights be defined that are appropriate for allocation to firms whose scale is that of fish harvesters? The economic answer to that question was, initially, limited entry and, later, ITQs.

The limited entry concept was based upon a narrow concept of fishing effort embedded in the Schaefer-Gordon analysis. Implicitly, fishing effort was interpreted either as literally one input or as a fixed factors production function (with zero substitutability between inputs). The defects of this oversimplified production concept became painfully clear under the initial limited entry programs. Because the potential for input substitution was ignored, economists and managers completely underestimated the extent of "capital stuffing" that would occur under limited entry. Given the right to operate a single fishing vessel, a firm had every incentive to increase any non-limited inputs used, including the size and power of the boat, the crew size, and the total amount of fishing gear.

Fisheries economists have now shifted their emphasis onto individual transferable quotas. The ITQ approach eliminates the incentive for firms to overcapitalize. In many fisheries, ITQs have been successful in generating significant rents. (See Neher [10] and Townsend [20].) But the incentive not to report landings under ITQ management is very large, so enforcement is often an expensive, if not impossible, task.

Moreover, the success of an ITQ system is inextricably tied to the effectiveness of on-going government decisions: The government defines and bestows a narrow set of privileges, the right to harvest some quantity of fish within a given period. The government, as an external agent, remains responsible for key decisions in the industry, including levels of current and future catches. As Edwards [6] has argued, this is a usufruct right, rather than a property right. The ITQ system is optimal only as long as government decision-making is optimal. The decision-making process does not incorporate directly those with the greatest self-interest in the resource, the harvesters.

THE CO-MANAGEMENT CONCEPT

In the wake of an often ineffective historical record of fisheries management, Jentoft [8], Rettig et al. [14], and others have promoted the concept of co-management as an alternative. The term co-management has been used to cover a very broad set of institutions. These institutions can be divided somewhat roughly into two groups: local collective governance of common property, and structures in which governance is shared between harvesters and formal government institutions.

The institution of common property (*i.e.*, common ownership and collective governance) is an alternative to either strict private property or open access (Ciriacy-Wantrup and Bishop [4]). Ostrom [11], among others, has argued that common ownership arises because these institutions are an efficient way to organize certain economic activity. Many of these institutions have been documented in non-Western cultures, such as the institutions of Pacific Oceania (Johannes [9]) and Japan (Ruddle [15]). They can, however, be found in Western cultures as well, such as the Maine lobster fishery (Acheson [1]).

The institutions of shared governance between groups of harvesters and formal government institutions are generally of recent vintage. Pinkerton [13] contains a number of case studies of co-management both between native populations and a national government and also between non-indigenous commercial harvesters and governments. The argument for shared governance implicitly suggests that, if government stimulates local involvement in the management process, effective local institutions of common property governance may emerge (or re-emerge in the case of indigenous populations) to replace central government management. Along these lines, Christy [3] and Panayotou [12] suggested that "territorial use rights in fisheries" (TURFs) patterned on the cultural institutions of common property could be the basis of efficient management.

For a number of reasons, local communities may be able to devise and to administer regulatory institutions that are superior to externally-imposed regulations. Local communities have extensive information about the resource and about the industry and its technology that may be very useful in designing effective rules. In a government-centered regulatory setting, that information is provided selectively to the manager. The manager faces the difficult task of separating true information from information that is provided falsely or incompletely. Once a set of rules is in place, the regulatory authority must enforce those rules. Locally-imposed rules may have the advantage of greater local acceptance, and hence may face less opposition. Local cultural norms may support rules that are self-imposed to a greater extent than they support externally-imposed rules. (This concept of the superiority of detailed local knowledge and cost-effective regulatory structures is also embedded in the economist's faith in decisions made by a holder of property rights.)

Co-management is not yet defined by a precise set of operational standards. This vagueness reflects both the relative newness of the concept in modern fisheries management and also the relatively wide set of differing, but related, concepts that now march under the common heading. To analyze the economic incentives of such institutions, however, both the decision

process and the allocation of the costs and benefits of management must be examined.

The decision process under co-management is some form of democratic governance. The definition of the electorate is often less clear. Governance by harvesters (only) is the most obvious definition. However, many of the arguments for co-management emphasize the interests of the broader social community, so an electorate extending to the entire local community is another possibility. Who may join the electoral body, how members of the electorate may be replaced (as upon retirement), and conditions under which electoral rights may be revoked or denied are also important questions that generally have not been addressed. Implicitly, the co-management concept is broad enough to allow wide differences in the definitions of these details.

The co-management concepts to date have implicitly left the decisions about the sharing of costs and benefits to be decided by the democratic process. That is, participants do not have a well-defined set of obligations or rights to the resource, aside from the right to participate in governance. This is in contrast to ITQ management (for example), where the ITQ owner has a well-defined right to harvest some pre-determined share of the overall quota. Although the sharing of costs and benefits may not be determined *a priori* under co-management, the democratic process clearly favors egalitarian results.

The governance structure just outlined is very similar to the governance of cooperatives, and especially of agricultural cooperatives. This is not surprising, as these two approaches to economic organization share many common philosophical roots. Agricultural cooperatives are governed under a relatively diverse set of rules, although most adhere more or less closely to the Rochdale principles. Those principles include democratic (one person/one vote) governance, fixed return on equity capital, and return of earnings in proportion to patronage (Cotterill [5]).

A CORPORATE CONCEPT OF FISHERIES MANAGEMENT

Co-management is not the only governance structure that could directly involve multiple local owners. With relatively minor modification, Scott's sole owners could be recast as shareholders in a fisheries governance corporation. In fact, Scott [18, p. 34] recently came to much the same conclusion:

"Thus an individual quota may become something like a share in a growing enterprise. ... the fisheries rights literature has failed to see individual rights as the nuclei of larger sole-ownership corporations or collectives."

Under a corporate structure, the government would simply determine the initial ownership shares of the fisheries

governance corporation. Corporate shares could be defined on the basis of existent ITQ distributions (as Scott suggested), but shares could also be defined without reference to any particular management strategy. The owners of the fisheries governance corporation would make decisions either directly, by voting their shares on management issues, or indirectly, by electing a board of directors to make those decisions. Through corporate governance, the owners would decide what management approach--such as limited licenses and gear restrictions, ITQs, or competitive bidding for harvest rights--were appropriate. The corporation would also decide when to invest in stock growth (by delaying harvest) and when to harvest. The corporation would internalize the various considerations that go into effective management, including the costs of implementing and enforcing various management options. A fisheries governance corporation could also be expected to finance its own operations, including administration, enforcement and stock assessment.

The corporate model, with some modest expansion, could accommodate some surprisingly broad management and social objectives. In particular, the ownership rights over the resource might be exercised by some type of joint public/private trust. For example, a trust might be created in which sixty percent of the shares were owned by harvesters and forty percent were held on behalf of broader local constituencies. A local port authority might be given some shares to help support port

operations, or the shares might be given to local charitable organizations, such as schools or hospitals. The "community development quotas" allocated to villages of indigenous populations in Alaska under recent pollock and halibut/sablefish ITQ management plans are a step in exactly this direction.

INCENTIVES UNDER CORPORATE GOVERNANCE VERSUS CO-MANAGEMENT

There are important differences between the incentives under co-management and those under corporate governance. These differences are most pronounced when looking at long-run incentives for owner/members. The decision structure under democratic co-management generates a greater financial stake in current income and a lesser financial stake in future income, as compared to the financial interests of a shareholder in a corporation.

To understand the differences between co-management and a corporation, consider a decision that would incur costs today in exchange for greater benefits in the future. Under the democratic voting of co-management, a majority of the current members must be convinced to incur those costs today. But because the sharing of the ultimate benefits are determined in later democratic votes, risk-averse voters will be reluctant to incur the known costs of the investment in exchange for uncertain benefits. Obviously, the more open the membership structure of

co-managed governance, the more serious this problem becomes. But even if membership is strictly closed, members who must incur greater costs (e.g., those with larger boats or greater financial dependence upon the fishery) have no assurance that they will be rewarded with greater benefits. This problem of short planning horizons for democratically governed institutions has been extensively analyzed for both agricultural co-operatives and worker-owned firms. (See reviews by Staatz [19] and Bonin *et al.* [2] on agricultural cooperatives and worker cooperatives, respectively.)

For a stockholder, on the other hand, the allocation of costs and benefits is clearly defined. Moreover, there is no distinction between current benefits and the present value of future benefits for a stockholder. A stockholder can sell the future stream of benefits to another party by selling the shares. The ability to transfer well-defined corporate rights also facilitates decision-making about investment decisions (as through stock re-building). Those who are willing to make such an investment can buy shares from those who do not favor the investment. In so doing, these investors not only incur all the risk of the investment, they also compensate the previous owners for the opportunity to make the investment. In return, they receive all of the future benefits. Also, because rights are more clearly defined, stockholders will find it easier to use the corporate shares as collateral for debt financing.

Inasmuch as many fisheries face the task of investing in the stocks (through deferred harvests), democratic co-management seems especially unsuited to the task at hand. When a fishery faces serious harvest reduction (or even complete cessation of harvesting) to promote stock re-building, the differences in the time horizons of corporate owners versus co-management voters is likely to be clearest. The superior access to debt financing (to finance the period of fishery inactivity) would also be an advantage for corporate shareowners.

On the issue of ownership transferability, co-management and corporate management arguments have fundamentally different perspectives. Advocates of co-management would probably conclude that stability in ownership will best promote effective co-management. (For example, see Pinkerton's [13, pp. 26-31] analysis of factors that promote co-management.) By contrast, the economic argument for making the ownership rights of a fisheries governance corporation freely transferable are compelling. Free transferability is essential for economic efficiency and will tend to conserve the resource. If the current owners are tempted to over-exploit stocks and risk future stock declines, some potential owners with more concern for the future (and hence lower discount rates) will place a higher value on the resource than the current owners. These far-sighted

investors will have a financial incentive to buy control of the fisheries governance corporation.

For example, if an environmental group determined that current resource owners were reducing future yields by excess harvests, it could purchase the resource in a depleted state. It could then reduce harvests to allow stocks to recover. Once stocks recover, rights to harvest the higher level of sustainable catch could be leased back to harvesters. If the environmental group's assessment of the over-fishing were correct, the initial purchase price would be low to reflect the inefficient level of over-harvesting. The financial return earned from leasing back the harvest rights for the higher, sustainable catches would generously reward the investment. Such investments might be rewarding for both the environmental goals and the endowment earnings of environmental organizations. And obviously, the same financial incentives apply to strictly private investors, whatever their environmental concerns.

Note that some conceptions of co-management may have some or all of the governance rules of corporations. That is, voting rights might be apportioned by ownership shares, rights might be freely transferable, and the rights to future harvests might be apportioned *a priori* on the basis of share ownership. Such a cooperative would be a *de facto* corporation, and the questions are semantic only. There may well be political reasons to give a

corporately-organized fishery management institution a "collective" or "cooperative" title.

CONCLUSIONS

This analysis emphasizes the different incentives that are created under the democratic, egalitarian rules of co-management as compared to corporate governance. While democratic governments may naturally establish democratic, egalitarian institutions for fisheries governance, these rules may be counterproductive to the goal of creating efficient economic incentives, especially in fisheries that require investments in stock recovery. To promote efficient resource use, governments would be well advised to address their equity concerns within the allocation of rights to a corporate governance structure rather than to leave equity considerations to on-going redefinition under co-management.

We have laid out the corporate fisheries governance concept without being drawn into details of the by-laws of such a corporation. Because of the inherent difficulty of delineating the fishery resource to be managed, fisheries governance corporations may be subject to special governance considerations. For example, special provisions or restrictions may govern interactions with other stocks or with protected species. There

may also be questions about the possible concentration of economic market power in the hands of a fisheries governance corporation. In that instance, special restrictions may be needed to prevent the exercise of monopoly power in output markets. While these sorts of administrative details are clearly crucial to any effective management approach, we leave them for future analysis. Our fundamental goal here has been to expand the scope of institutions that are considered for management of these important natural resources.

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